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PEOPLES' PERCEPTIONS ON HUMAN-ELEPHANT CONFLICT IN KAMENG ELEPHANT RESERVE OF NORTHEAST INDIA



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Abstract: Large-scale forest destruction and encroachment of the forest habitat has resulted higher human-elephant conflict in all the elephant range countries of the world. The Kameng Elephant Reserve of Arunachal Pradesh, India is located at the northern boundary of Sonitpur Elephant Reserve have comparatively more dense forest (particularly in Pakke WLS), yet there is some degree of human-elephant conflict reported from this region. So, an attempt was undertaken to understand the people perception of the status of human-elephant conflict in Kameng Elephant Reserve. For this a questionnaire was prepared covering 21 parameters on human-elephant conflict. Study found that the status of elephant – human conflict is on increasing trend. Villagers in this region are economically very poor and have 5 to 7 dependents, so any damage to their property and life further affect their livelihood. The people of this region have started considering elephant as an animal or as their enemy, but not as an object of worship. This change in attitude reflects the nature and degree of human-elephant conflict of this area. There is an irregularity in payment of ex-gratia by the concerned department and only a few people were reported to receive the ex-gratia for crop damage. However most of the villagers think that the electric fence and rubble wall are the only way to prevent human-elephant conflict. Overall peoples' attitude towards elephant is very negative and if no efforts are made, it could have some effect on the conservation of elephant in the near future.

Keywords: Asian Elephant, Kameng Elephant Reserve, Peoples' perception.

INTRODUCTION

An increase in deforestation and encroachment into forested areas has led to an increase in elephant-human conflict all over the elephant range countries of the world. This leads to the death of about 300 people in Asia every year (Kemf and Jackson, 1995). India itself records losing over 190 elephants a year annually (Bist, 2000). Recently, the death of 18 elephants due to poisoning in Sonitpur Elephant Reserve (Gureja et al., 2002) accentuates the gravity of this problem. Elephant mortality in retaliation to crop depredation and human killing and due to poaching has far reaching implications for the long-term survival of the elephant population.

The major impact of the human-elephant conflict is on the socio-economic status of the villagers living in and around the elephant habitat, they experience the worst kind of problems that an elephant can cause. As the villagers are not getting a direct benefit from elephant, they have developed a negative feeling for elephant and hindering the conservation effort. Hence a site-specific study to understand peoples' perception of the issue of human-elephant conflict has a great value in knowing the status of the conflict and also for conservation strategies. However, very few studies were conducted on this aspect till date (Nath and Sukumar, 1998; Dayte, 2005).

The North Brahmaputra Elephant Range (ER) of India (Project Elephant, 2007) is located in the foothills of the Eastern Himalayas consisting of three elephant reserve, namely Kameng, Sonitpur and Manas. Both Sonitpur and Kameng Elephant reserves are connected with Bhutan in the northern side and further is connected with the Manas ER that extends up to Duar belt through Himalayas Foothills and Tarai tract. The entire range supports 3,250 elephants among which the Kameng and Sonitpur Elephant Reserves supports 31% of the elephants. However, very recently large-scale destruction in Sonitpur ER (Kushwaha and Hazarika, 2004) has led to higher human-elephant conflict resulting 213 deaths in Sonitpur district of Assam between 1991 and 2001 (Assam Forest Department, 2003). On the other hand Kameng ER (particularly in Pakke WLS) the forest is intact, yet there is some degree of human-elephant conflict reported from this region.

Some information about the status of the human-elephant conflict in Sonitpur ER is available. However for Kameng Elephant Reserve practically no understanding of the conflict is there. The understanding of the conflict status in Kameng will directly link to the conservation of Asian elephant in both Sonitpur and Kameng Elephant Reserves. However a successful implementation effort depends on the

people, their perceptions, and attitude towards the issues. If these aspects were not taken into account, conservation goals would be difficult or costly to achieve in terms of time and resource. It is important to understand that villagers located close to elephant habitat often complain about the lack of support from concerned agencies during the peak depredation season. An attempt was made to study peoples' perception of human-elephant conflict in Seijosa and Tippi areas with the following objectives.

- To find out socio-economic condition of the villagers in Kameng ER - To assess the cause and extent of human-elephant conflict from peoples' perception.
- To find the methods followed to scare elephants - To find out the peoples' view or suggestion on conflict mitigation.

STUDY AREA

Pakke Wildlife Sanctuary (PWS), Sessa Orchid Sanctuary, Eaglenest Wildlife Sanctuary, Amartala Reserved Forest (RF), Papum RF and Doimara RF come under Kameng ER. The study area includes the Darlong, Upper Seijosa, Bali, A-2/ Mebuso-I, A-3 and Jolly villages (all located in Papum RF at the eastern boundary of Pakke WLS) and Tipi (located in Amartala RF at the western periphery of Pakke WLS) (Table:1). Darlong is the oldest village settled during the British period. Upper Seijosa came during 1962.

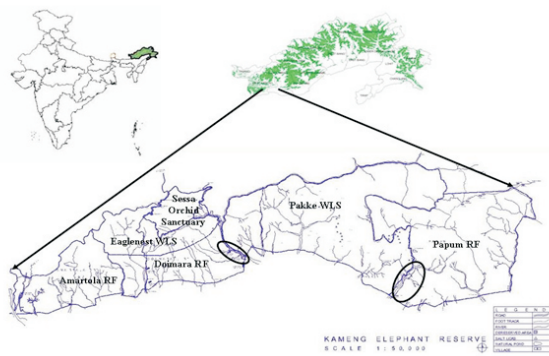


Figure-1 : Map of Kameng Elephant Reserve showing the survey areas.

Table-1: Study villages, number of houses and population size

SL.No.	Village	Circle	Household	Population
1	Darlong	Seijosa	229	1071
2	Upper Seijosa	"	268	1316
3	Bali	"	35	197
4	A-2/ Mebuso-I	"	40	219
5	A-3	"	12	76
6	Goloso	"	46	155
7	Jolly	"	21	112
8	Tipi	Bhalukpung	174	611

In Seijosa, all the villages covered under the study are residing by the Nyishicommunity. They are also called as "Bangnis". There are four types of "Nyishi" namely Tagin, Pakketing, Yano and Kodong. Most of the Seijosa people belong to Yano. In Tipi, the Miji(Sajolang) is the dominant community. They are Mongoloid in origin.

METHODOLOGY

Twenty one parameters that include socio-economic aspects of the villagers, extent of human-elephant conflict, preventive measures, alternate income source and conservation value of elephant were considered for the survey. A questioner data sheet was prepared for this study. The data collection included following parameters:

Socio-economic condition of the villagers - Number of dependents, general occupation, prime source of income, prime crops cultivated, purpose of cultivation (subsistence or commercial)

Human-elephant conflict

- i) Elephant visit : Frequency of elephant visit, seasonality of elephant visit, visitor detail- Herd or solitary, time of visit, place of/from where elephant visit etc.
- ii) Cause of conflict ; Deforestation/ habitat loss, shortage of food, behavioral change, other cause etc.
- iii) Extent of conflict - Damage (%) to each farmer, degree of damage: increased or decreased, tolerance of crop damage & conflict, changes in daily life due to conflict, bad experience with elephant (human death/injury), cause of such experiences etc.

Preventive measure

- 1. Response from the concerned departments and villagers
 - a) Forest department response- Types and efficacy
 - b) Villager response - Types and efficacy
- 2. Methods of prevention - Use of cracker, use of fire ball, noise through beating of drum, gun shot, other methods etc.
- 3. Suggested solution - Electric fence, trench, rubble wall, watchers, other types.

Alternatives/compensation to crop damage

- 1. Ex-gratia payment - Number of cases applying, number of cases received ex-gratia, discrimination if any in ex-gratia payment
- 2. Alternative income source
 - Alternate income source
 - Consideration of alternate sources of income

Elephant – is it worth conserving?

- i) Common belief - General belief as God, as an animal
- ii) Is it worth conservation? - Change of religious title, reasons, Is it worth conserving elephants?

A total of 43 people from Seijosa and Tipi areas were interviewed. The age group of the people interviewed is given in Figure 2 and most of them were between 16 to 75 years.

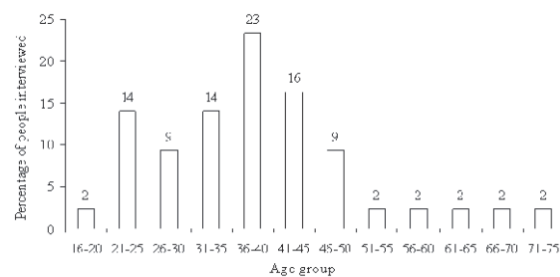


Figure-2: Age-group of the people interviewed during questioner survey

Results

Socio-economic condition of the villagers

Number of dependents

An average of 7 individuals per family was recorded in Seijosa and Tippi areas. A high of 15 and a low of 3 individuals were recorded through the surveys. Most of the families have 6 individuals/family, which composes 20% of the total population followed by 7 (14%) 8 (13%) and 12 (12%) individuals/family. Five and 15 individual/ family composes 10% and 3 individual/family composed of 1% of populations in surveyed areas (Figure 3). The overall results indicate families with 4 to 6 individuals were the most common in Seijosa and Tippi areas.

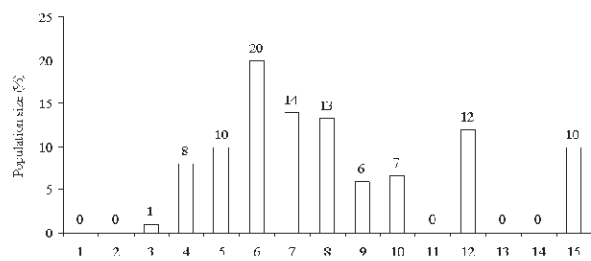


Figure-3: Family size and number of dependents for each village. Population size (%) is plotted against number of individuals.

Occupation and source of income

Eighty six percent of the total people interviewed were farmers followed by 7% businessmen, 4.7% government service and only 2% daily labour (Figure:4). This suggests that agriculture constitutes the backbone of the economy of these areas. Rice was the prime crop cultivated and this is mainly for subsistence.

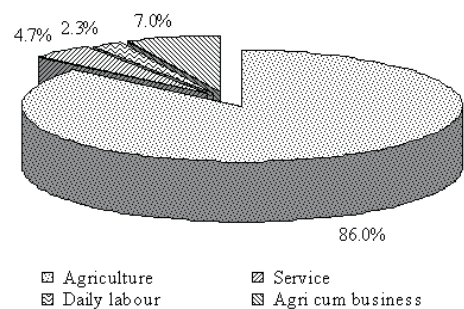


Figure-4: Occupation status of the villagers in the surveyed area.

Human-elephant conflict

Seasonality of elephant visit

Forty two percent of the people interviewed were of the opinion that October to December is the most common season of elephant visit followed by 30% that said in October

to January, 12% in October to February, 7% in September to December and 5% for both August to December and October to November. This indicates that October to January is felt to be the most common season of elephant visit (Table 2). Both herd and solitary individuals are known to visit the villages, primarily from the Pakke Wildlife Sanctuary to the villages during the night hours.

Table-2: Seasonality of elephant visit

SL No	Season of elephant visit	Percentage
1	August to December	4.65
2	September to December	6.98
3	October to November	4.65
4	October to December	41.86
5	October to January	30.23
6	October to February	11.63

Cause of human-elephant conflict

Fifty eight percent of the people surveyed stated that large-scale deforestation in Papum RF (where the villages are located) is responsible for a higher human-elephant conflict in Seijosa area. If clumped together, it 83.7% of the villagers belief that a higher human-elephant conflict in Seijosa area because of large-scale destruction of the Papum RF, habitat loss and shortage of food for elephant. Only 11.6% of the total villagers belief that a change in elephant behaviour and another 4.6% villagers behaviour along with shortage of food and destruction of the Papum RF is responsible for higher human-elephant conflict in Seijosa (Figure 5).

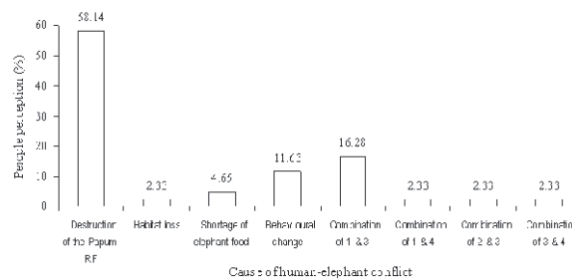


Figure-5: People perception on the cause of human-elephant conflict

Extent of human-elephant conflict

(a) Crop damage

According to the villagers interviewed, human-elephant conflict has been increasing. About 41% of the villagers received 51 % to 75 % of damage followed by 37% villagers had 26 to 50 % of damage, 7% villagers had 76 to 100% damage and 5% of the villagers experienced 1 to 25% damage. About 5% of the villagers did not receive any damage to crop while 5% of the people had no opinion about the status of conflict during this survey (Figure 6).

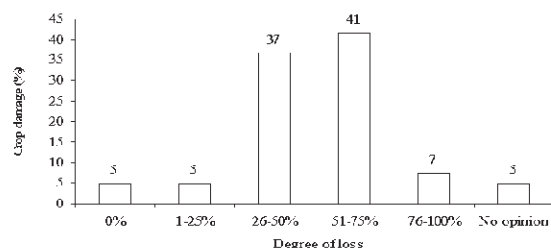


Figure-6: Villagers' opinion on the status of crop damage. Crop damage (%) is plotted against the degree of loss.

When villagers were asked about the tolerance level to crop damage, about 59% of the total villagers interviewed had no answer. However, no single person favored tolerance to crop damage. Forty one percent of the total people showed a negative tolerance to crop damage. However, a comparison of the tolerance level with that of individual level degree of damage showed a negative tolerance to crop damage irrespective to the degree of damage (Figure 7). It also indicated that people who received 26-75% of total individual damage showed the highest degree of negative tolerance to crop damage. This might be because of economic loss due to crop damage.

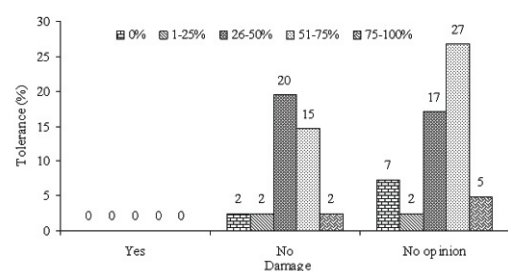


Figure-7: Villagers' tolerance level towards crop damage. Tolerance level (%) is plotted against the degree of crop damage.

It was also found that conflict has an adverse affect on their daily activity pattern. The villagers were not able to sleep properly during cropping season and most of them had to guard the paddy field at night. This has resulted in change in diurnal activity pattern of people during crop season.

(b) Human death and injury

Thirty seven percent of the people have had bad experiences with wild elephants; according to them people have been killed due to conflict. Among these 6 incidents, two deaths took place inside the forest area while the concerned individuals were grazing cattle. Three people died due to unproven attack of wild elephant inside the village. Villagers did not know the reason for one death. However, all these deaths took place about 10 to 15 years ago.

Preventive measure

(a) Forest department response

Ninety five percent of the villagers surveyed stated that the response of the forest department was very slow in preventing elephant from conflict. Most of the cases, the forest department provided cracker to the villages, but the number of crackers given was very less compared to their requirement. Occasionally, the department provided elephant to chase the wild elephant from the crop field.

(b) Methods of prevention

Among all indigenous method, crackers were least used in Seijosa area as stated by the villagers during survey. Other methods like drums and fireballs were mostly used to chase wild elephant. About 40% of the total cases, combination of drums and fire balls were used in chasing elephant followed by a combination of fire ball, drum and cracker on 33% occasion and a combination of cracker with fire ball of 9% as reported by the villagers (Table 3).

Table-3: Methods of preventing elephant

SL.No	Methods of chasing	Uses (%)
1	Beating drum	2.33
2	Use of cracker	2.33
3	Use of fireball	13.95
4	Combination of 1, 2, 3	32.56
5	Combination of 1, 3	39.53
6	Combination of 2, 3	9.30

(c) Suggested solution

When asked about the solution of the human-elephant conflict, most (58%) of the villagers had no answer to the question. However, about 19% of villagers suggested for electric fence followed by 16% for trench and rubble wall, 5% for watcher and only 2% for combination of Electric Fence, rubble wall and trench to prevent wild elephant (Table 4).

Table-4: People's suggestion on elephant preventing method

SL.No	Methods	Suggested solution (%)
1	Electric fence	18.6
2	Trench & Rubble wall	16.3
3	Watcher	4.7
4	Electric Fence, Trench, Rubble wall	2.3
5	Not known	58.1

Ex-gratia payment

A total of 72 persons have received compensation (ex-gratia) for crop damage. However, only one third of the total applicants received ex-gratia for crop damage. This indicates that only a few people received ex-gratia for crop damage resulting in no faith in ex-gratia payment leading to lack of interest in filing complaints for ex-gratia to crop damage.

Alternate source of income

A total of only 7 % of the total people have an alternate source of income to crop cultivation, and 2% had no opinion. Hence, crop damage may have an adverse affect on

the economy of a majority (91%) of people of this area (Figure 8).

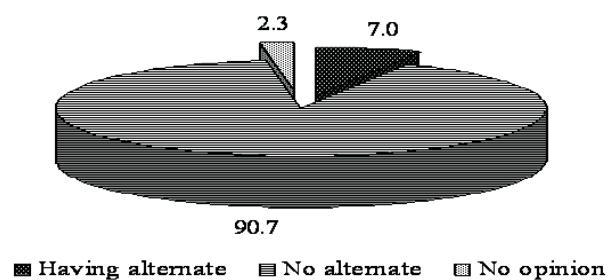


Figure-8: Opinion about the alternate income. Percentage of people who have the option of alternate income.

When the majority (do not have alternate income) was asked about considering an alternate source of income, most of them (74 %) want to consider an alternate source of income (Figure 9). Among those who have alternate income a majority of them (72%) like to continue to maintain their income through alternate income.

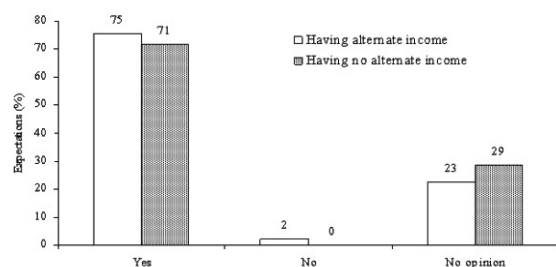


Figure-9: Consideration of alternative source of income

Elephant – is it worth conserving?

General view

While most of the people of India believe elephant as the replica of God, Ganesha, people of this region do not have such belief. During this survey, most (81%) of the people pointed out that they do not consider wild elephants as God (Figure 10). This must have an impact on the conservation of elephant in this region.

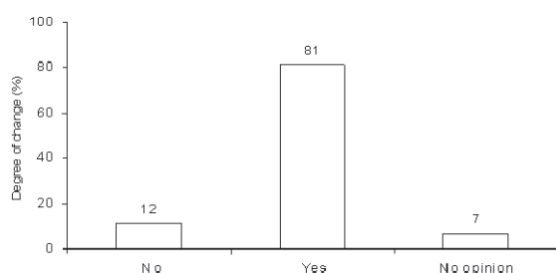


Figure-10: Opinion on conserving elephants. Degree of change (%) of elephant as not a God, by villagers is

plotted against their opinions about it.

When villagers were asked to consider elephant as enemy or friend, most (58 %) of the people consider wild elephant as an enemy or devil while 12% of the people treated them neither as an enemy nor as a friend and only as an animal. However, 30 % people had no answer to this question (Figure 11).

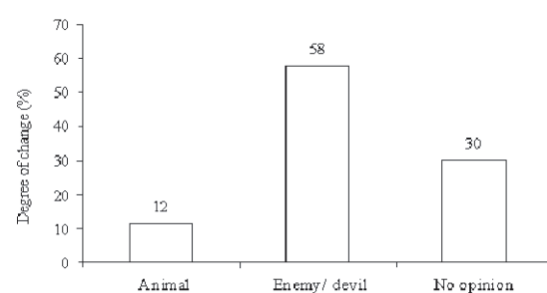


Figure-11: Current opinion on elephant by the villagers. Degree of change (%) of villagers' opinion is plotted against their opinions of elephants as animal or enemy or devil.

As most of people consider the elephant as enemy, the conservation of wild elephant could be a tough job. A total of 27 % (Figure 12) of the people were not interested in conserving wild elephants, while 21 % people believed that elephant should be conserved, and the majority of people had no opinion of conserving the species.

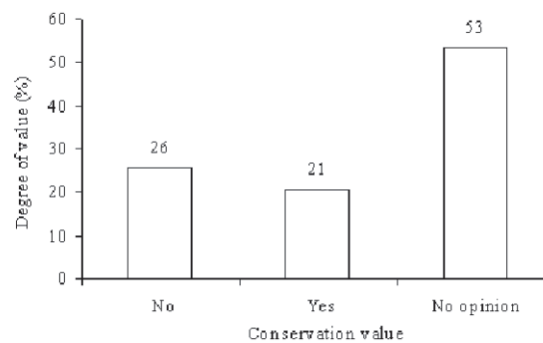


Figure-12: Conservation value of elephants: Degree of value (%) is plotted against elephants' conservation

However, most of the people (53%) were very confused about the question of conservation of wild elephant. This indicates that the conservation of wild elephant from the people perception is a matter to be discussed. Although most of the people failed to answer the question of the value of elephant conservation, almost an equal number of people had a positive and a negative approaches for elephant conservation irrespective to degree

of damage received by them (Figure 13).

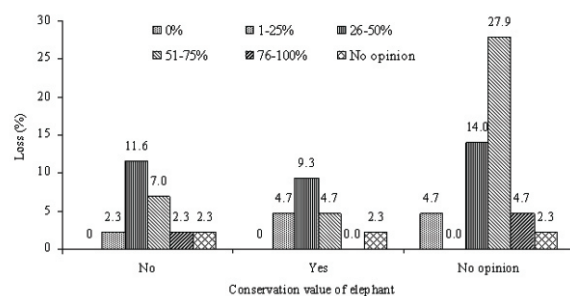


Figure-13: Conservation value of elephants in relation to crop damage. Loss (%) due to crop damage or other aspects is plotted against villagers' opinion of conservation value of elephants.

DISCUSSION

Most of the villagers are agriculturist; being very poor any damage to their property has an adverse effect on the social and economic status. Most of the villagers are very poor and have 5 to 7 numbers of dependents each. So any small damage to crop cost drastically affects their economic status. Beside this, the crop is meant for substantial use and no surplus production of crop was noticed. Apart from this, they do not have any alternate to such damage. So, all the people were reluctant to such damage though it was practically 2 to 3% of the total area cultivated.

The problem is not a new; they have been suffering since long back and so were reluctant to such problems. But in recent years since the degree of human-elephant conflict has increased and reached its highest peak and therefore, the attitude of the villagers towards elephant has greatly changed. Since the people of this area being a tribal race, they do not have any special faith (eg. Ganesha). Hence an increase of human-elephant conflict in this area has leads into a change in people attitude towards elephant as the enemy. This change in attitude must reflect the nature and degree of human-elephant conflict of this area. There was an enormous irregularity in payment of ex-gratia by the department as informed by them. Very few people were reported to receive the ex-gratia for crop damage. So, they have lost interest filing such complain. This might have a negative reparation in the near future that may affect the conservation effort for elephant.

Though the number of human death or injury cases due to conflict was very less compare to other parts of India, about 37.2% of the total people had a bad experience on elephant which may be due to a past experience through age. They often have a close contact with elephant once they visit into the forest for NTFP collection.

As the people belief that a destruction of the forest habitat of Papum RF along with a behavioural change has resulted an increase of human-elephant conflict in this area, most of the people think that the EB Fence and rubble wall are the only way to prevent human-elephant conflict. Since, they are lacking of knowledge about the efficacy of these measures, they expected these measures. Interestingly, a few

people suggested for providing watchers in elephant scaring activity even before initiation of the scheme.

Any effort for the conservation of elephant has no value until it is supplemented by site specific mitigation measure to reduce human-elephant conflict. However such conservation project must considered the people perception; otherwise conservation of elephant will be meaningless.

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